PURDUE UNIVERSITY
LAFAYETTE, INDIANA

BIOPHYSICAL LABORATORY

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Dear Josh,

Thanks for your comments on my ms. I have not been trying to match your 3 month time lag, but our new baby girl Martha Jane, born July 8, doing fine and growing exponentially, thank you, has slowed things up a bit.

Comments on your comments: The relationship between time of lysis and lactase content is not a simple one, complicated as it is by physiological heterogeneity and the spilling out of enzyme as lysis proceeds. Under all conditions of induction and "deinduction" used, the higher the specific activity of a culture the sooner it lysed, the degree of "dispersion" being such as to make it unlikely that one would miss the detection of any heterogeneity much greater than, say, one third of the cells having twice the average activity. Due to overlapping, of course, the distributions observed always appear more uniform then the actual ones. Thus, while broken curves (figure 6C) clearly require a heterogeneous distribution, a straight line does not conclusively prove a uniform one.

Although the optical density has not been directly correlated with the lysis of cell populations (this should be done) the fact that straight lines are obtained (enzyme released vs. decrease in o.d.) for fully induced cultures is rather suggestive. There could be a fortuitous cancelling out of a cockeyed lysis-optical density function and a cockeyed enzyme-per-cell distribution, but this seems improbable. The Doermann effect does not occur with the phage used (which resembles T1).

Cultures grown without inducer are of course not devoid of lactase. There was always present a specific activity of the order of 10^{-3} of that in a fully induced culture. Cohen-Bazire and Jolit have shown that(in ML) the spontaneous appearance of constitutive mutants gives the same order of activity. Whether this accounts for all the activity, down to a possible single enzyme molecule per cell, cannot be said.

The question of "activation by cell lysis" does not enter into my experiments since the measurements were always of either extracellular enzyme or toluenized cells. I will be very interested to learn what Boris finds out about this problem.

We missed you at Cold Spring Harbor. Surely you have a dozen momentous discoveries to tell about. Are you going to Bellagio, Rome, etc.?

Best regards to Esther, Larry, Tom, Boris,...

P.S. Has anyone done any more on UV-ing transducing filtrates?

Sincerely,

Seymour

Seymour Benzer